



THE

CONCENTRATES

UNIVERSITY OF
SASKATCHEWAN



1909
1959

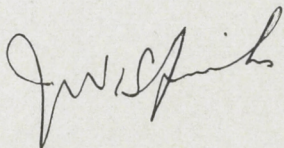
GOLDEN
JUBILEE

FOREWORD

A short while ago we celebrated the Golden Jubilee of the University. During the celebrations we talked of the tremendous strides made in the previous half century and sang the praises of those who, with great daring and courage, established a University in the heart of the prairies.

In singing the praises of the University as a whole we were, of course, indirectly singing the praises of the many departments, colleges and other groups which go to make up the University. The present publication, which records the history of the Department of Geology, indicates in a very direct way that our pride in the development of individual departments is well founded. It is a story of steady accomplishment and development, often in the face of considerable difficulties, leading to the establishment of a thoroughly modern department, well equipped and ready to meet the challenges of the years that lie ahead. The list of publications and theses indicates the strong research interest in the department and the value of these researches to the Province and to Canada as a whole.

The University is grateful to the members of the staff of the Department of Geology who, by their untiring efforts, have brought about these impressive developments. It looks forward with interest to the exciting developments which we can confidently expect in the "next fifty".



March, 1961



HISTORY OF DEPARTMENT

Beginnings, 1924-1929

The first classes of the University of Saskatchewan assembled in the Drinkle Block at the corner of Second Avenue and Twenty-first Street in the fall of 1909. Fifteen years later in the session 1924-1925, when the total enrollment of the University was 656, the first class in geology was given by Professor W. G. Worcester, now Professor Emeritus of Ceramic Engineering, to a couple of dozen students taking the courses in Civil and Ceramic Engineering.

Interest in geology in informed circles in Saskatchewan increased as the time approached for the Western Provinces to receive control of their mineral resources from the Federal Government. This transfer occurred in 1930. As from its inception the University has been, and still is, considered the Province's chief research institution, it was only natural that the establishment of a Department of Geology should take place. It was in 1914 that the Turner Valley gas and oil field was discovered. Even then it was evident that further finds might well initiate the tremendous developments that, in recent years, have changed greatly the economy and living conditions in the West. Prior to 1930 the mineral resources of chief interest to the Province were, the lignite coals, ceramic clays, and the sodium sulphate deposits present in its southern part. However, the Precambrian section, the northern two-fifths of the Province, was an intriguing terra incognita that was a further argument for the establishment of a Department of Geology, and from its inception the Department has increasingly been involved in mapping and research with respect to the geology and mineral deposits of this vast area.

In 1926 F. H. Edmunds, a graduate and M.Sc. in Geology of the University of Liverpool, where he studied under Professor P. G. H. Boswell, a distinguished pioneer in sedimentary petrology, joined the staff of the Department of Soils as assistant professor. Although he gravitated naturally into the field of geology, his contributions to Soils Science in the form of publications and in an advisory capacity have continued throughout the years. During the session 1926-27 he gave his first class in geology, taking over from Professor Worcester. In the fall of 1927 Dr. Justin S. Delury came to the University and with Edmunds constituted the first faculty of the Department of Geology. Next year Professor Delury went back to the University of Manitoba to take over the chairmanship of the Department of Geology there. A year later, 1929, Dr. J. B. Mawdsley was appointed, a graduate in Mining Engineering from McGill University and a Ph.D. in geology from Princeton, where he studied petrology and ore deposits under Professors C. H. Smyth and A. F. Buddington. After completing his graduate work in 1924 he was on the staff of the Geological Survey of Canada till he resigned to come to the University of Saskatchewan. During this five-year interval he was involved in geological mapping in northwestern Quebec, chiefly in the Noranda-Bell River Area and in the Chibougamau Lake District. Both these were then undeveloped areas of great prospecting interest that have

since become important mining districts for base metals and gold. Professors Edmunds and Mawdsley constituted the faculty of the Department till 1940. On account of staff limitations the apportionment of classes at times did not wholly correspond with their chief interests. However, Edmunds was far more at home teaching a class in mineralogy than Mawdsley was teaching a class in paleontology, for which, by necessity, he developed a great respect.

Depression and Drought, 1929-1939

Although the stock market broke in the fall of 1929, its impact did not hit the University till the following year. To make things worse a long and persistent drought from 1931 to 1937 converted much of the settled part of the province into a semi-desert. Parched pastures, drifting soil, dried up sloughs, abandoned farms, and the resulting general hardship then present are things hard to visualize today. During this period salaries at the University were, of necessity, cut and junior members of staff were sent on leave on quarter pay. Enrollment started to decrease, but the statesmanlike handling of the crisis by President Murray stopped this tendency and the enrollment slowly rose during the latter part of those bad years. This was due to the passing of a regulation allowing a student to come to the University on credit for a year, but if he wanted to come a second year he would have to pay the previous year's fees, and to obtain a degree it was necessary to clear off all outstanding debts to the University. As there were absolutely no jobs available many came to the University, lived most frugally, but got what they wanted, an education. The enrollment in the session 1930-1931 was 1,610, in 1931-1932 it sank to 1,562, but by 1938-1939 it had risen to 1,810.

Summer employment was practically non-existent, but as it was realized that field experience was essential, the students of geology in 1934 formed parties and spent the summer in the North, inexpensively, but profitably gaining experience. Fifteen students were so occupied. Out of this group of able, determined and resourceful men have come some of the Department's most distinguished graduates.

The following year the Conservative Government of the Honourable R. B. Bennett supplied the Geological Survey of Canada with one million dollars, the main objectives being to give summer employment to a considerable number of university students. Over one hundred and thirty were assigned to field parties from this university, among them the score or so of geology students.

During this period the two members of staff took what summer jobs were available with government agencies or industry. Before provincial funds ceased to be available J. B. Mawdsley spent the summer of 1931 searching for favourable prospecting areas within the Churchill River Basin. A sabbatical year in Eastern Canada in 1937-1938 involved in economic geology convinced him that teaching at Saskatchewan was his main interest. During his absence George Shaw, B.Sc.'32 (Sask) and an M.Sc. in geology from McGill University took

over his classes.

As might be expected there was little or no money during this period for new space or equipment. The space allotted to laboratories and offices for the Department comprised the southeast corner of the Engineering Building, south of the main corridor. This was twice the space occupied in 1929.

During this period, in 1935, the course in Geological Engineering was initiated with the help of Dr. C. J. MacKenzie, then Dean, to meet the needs of students in the College of Engineering who wished to enter the mineral industry. It resembled closest a mining engineering course with a strong geological option. It was open to students who had honours standing, an average of seventy per cent in their first two years. There has been no fundamental change since. The course is still a combination of engineering and geology. Students particularly interested in the petroleum industry are allowed a couple of options. The barrier, however, was dropped from seventy per cent to sixty-five per cent as a number of men suitable for the industry were being kept out. It has been a very successful course, judging by the record of its graduates. However, the Department is the first to recognize that this is largely due to the above-average calibre of these men.

One of the factors that made it possible for the Department to initiate this course was the generous help received from Dr. T. Thorvaldson, who, though the busy head of the Chemistry Department, volunteered to give the class in metallurgy, now replaced by physical chemistry, and Dean R. A. Spencer, then Professor and Head of the Department of Civil Engineering, who took over part of the class in mining. These two gentlemen are not liable to be forgotten by the students they taught.

The lack of money was not an obstacle to fellowship and fun, and during the session of 1934-1935 the Ore Gangue was formed. Then, as now, it played a part in entertainment and in being a forum in which the members recounted their summer's experiences, thus supplying training in public speaking and helping to acquaint one another with field methods and conditions. The Department is proud of the consistent and enthusiastic way this autonomous organization of its students has always operated. This anniversary edition of the Concentrates is an outcome of the wishes and efforts of this year's Ore Gangue.

World War II - 1939-1945

At the outbreak of war there was just short of 2,200 students on the campus. In the dark year of 1943-1944, when the struggle was at its height, the number had dropped to 1,446, and already there had been heavy losses among the University's graduates and the men who left college before the completion of the training for the peace time jobs they desired. By the end of the war the

Department had lost in the Services eight of its graduates and former students. Among them were men with outstanding personalities who were prominent among their fellows, even at college. The graduates wished that they might be remembered and on November 11th, 1948 a plaque bearing their names was unveiled by President J. S. Thompson. It was designed by Professor A. L. C. Atkinson and is reproduced at the back of this booklet.

Professor Atkinson, who is now on the staff of Royal Roads, the Services' College at Esquimalt, British Columbia, was then on the Faculty of Engineering and for many years gave the class in descriptive geometry to the geology students. Besides being an expert in descriptive geometry, he was a student of heraldry and aptly designed many of the "armorial bearings" of colleges on this campus such as Engineering, Commerce, Agriculture, Graduate Studies and recently, Arts and Science. He was also commissioned by the City of Saskatoon and the United Services' Institute to design theirs. One of the first he did was the Ore Gangue shield which appears on the cover of this publication.

Dr. A. R. Byers joined the faculty in the fall of 1940, a long-desired addition to the staff as the number of students under instruction had greatly increased. An Honours graduate of McGill University in geology and he received his Ph.D. there in 1936 under the guidance of Professors J. J. O'Neill, J. E. Gill and Fitz Osborne. His interests are chiefly in structure, Precambrian stratigraphy, and mineral deposits.

During the War the government instructed the universities to train all able-bodied students for the war effort. On this campus the Canadian Officers Training Corps mushroomed overnight and a further unit, the Reserve Battalion, was organized. The three members of the geology staff became officers in these units. When the University Naval Training Division was established at this University in 1943, there being no faculty member in the University with a naval background, Professor Mawdsley, for some obscure reason, was assigned the command which he held till retired as captain in 1956. Professor Edmunds retired as a major and Professor Byers as a captain.

Differing from many universities the bulk of the University faculty were involved with the students in this military training. It made for a close understanding and a university with high morale. However, it greatly increased the load borne by both faculty and students. Studies and research of necessity suffered. As geologists and mining engineers were not considered particularly valuable in the war effort, the number of students specializing in geology and geological engineering rapidly dropped till in 1945 only one was graduated. The faculty during the summers were mostly occupied with geological mapping or the investigation of matters of potential value to the Country in this struggle.

Post-War - 1945-1957

Just prior to the end of the war the enrollment in the University, during the session 1944-1945, was 1,607. The next year it more than doubled to 3,471 and in 1947-1948 it reached 4,310. From that it rapidly dwindled to the low of 2,056 in 1952-1953. In 1945 the veterans were on us like a flood and the time until 1950 was tempestuous but interesting. Space and staff were inadequate and much technical equipment, such as petrographic microscopes, had not been manufactured during the war and was unobtainable. It would have been a hopeless rear guard action if it had not been for the spirit of good-humoured determination in which these veterans went after the knowledge they wanted, in a similar, but less deadly manner than they had engaged the enemy. With few exceptions they were a mature, appreciative lot who knew what they wanted. It was a strenuous pleasure to teach them. When the flood ebbed away, although there was a sense of relief, there was also a definite feeling of loss. Their ages and maturity made them closer to the staff than students usually are. Their stints in the Services had given them poise and assurance, and a knowledge of their fellowmen which resulted, after graduation, in many rapidly attaining posts of great responsibility in the mineral industry. In 1948-1949 the senior year consisted of 33 students, all of them geological engineers. If a lecture had not been properly prepared, it was wise to tell them at the start. They viewed such admitted delinquencies with understanding tolerance.

To aid in handling the load, Dr. J. D. Weir joined the staff in 1946. He graduated with High Honours in 1935 and as Rhodes Scholar from this University, spent the next two years at Oxford, and a subsequent couple at Harvard. Among his varied field experiences was participation in the British expedition under Dr. J. V. Harrison that in 1939 made a rapid plane-table survey across the Central Andes of Peru. He came to us from the California Standard Company and returned to them the following year when their rapidly expanding program of exploration in Western Canada offered him a post of such interest and importance that it could not be declined. He is now a vice-president of the Company.

Dr. Weir was replaced from 1947 to 1949 by John Riddell, a graduate in Mining Engineering and completing his Ph.D. work in geology at McGill University. During the war he served with R.C.A.F., and prior to that had been on mine staffs in South Africa. Weir was a 'soft rocker', Riddell definitely a 'hard rocker' which meant that a certain redistribution of classes was necessary among the four members of the staff. The dropping enrollment resulted in the reduction of personnel and the Department regretfully lost him the spring of 1949. Since then Dr. Riddell has been on the McGill staff and in 1957 was appointed head of the Department of Geology, Carlton University, Ottawa.

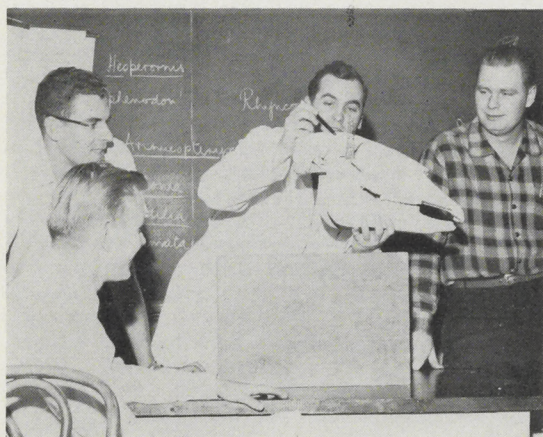
During the war years oil and gas exploration underwent a considerable acceleration. Commercial gas had been discovered at Lloydminster in 1935, but it was not until 1944 that oil was developed commercially. Professor Edmunds was associated with this early work



"High Grade Ore"



"Mountain Glaciation"



"Head bone connected to
the "

and has done much of the consulting work in the Lloydminster area to the present. The discovery in 1947 of the Leduc reef field containing light oil in Alberta greatly stimulated exploration in the prairie region. Active drilling in Saskatchewan during the six year period 1950-1956 resulted in the discovery of forty-two oil pools. It is estimated that the yearly expenditures incurred by the Petroleum Industry in Saskatchewan in 1950 was \$8,000,000, in 1954, \$86,420,000 and in 1956, \$154,700,000. The rising interest in oil resulted in a high proportion of the graduating students entering the oil industry. This development also meant that the Oil and Gas Division of the Department of Natural Resources, now Mineral Resources, at Regina was inadequately staffed to handle the specimens and information they were receiving. Much of Professor Edmund's time and that of one assistant for a number of years was involved in this work. Mr. C. A. L. Hogg, B.Sc.'35 (Sask), then Deputy Minister, saw a temporary solution of mutual assistance to his Department and the Geology Department at the University, and accordingly in the fall of 1950 Dr. W. O. Kupsch joined the geology staff on a half-time basis. The rest of his efforts were involved in processing samples and recording data for the Department of Natural Resources with the help of D. R. Francis, B.E.'50 (Sask) as assistant and a secretary and two technicians. The latter operated a machine designed by Professor G. W. Govier, of the University of Alberta, for cleaning well chippings and preparing them for study. Being a systematic person, Dr. Kupsch, during this interval compiled the first edition of the very useful Annotated Bibliography of Saskatchewan Geology. Because of the rapid expansion of the drilling for oil the Government decided in 1952 to move all this work to Regina, and at that time Dr. Kupsch became a full time member of the Geology Department.

Dr. Kupsch received his undergraduate education at the University of Amsterdam. In 1946 he received a Netherlands-America Foundation Scholarship which took him to the University of Michigan where he completed his work for his Ph.D. in 1950. He has since done field work for the Department of Mineral Resources, Regina, and various oil companies. In 1958 this work took him to Peru and in 1959 to the North West Territories, north of Great Bear Lake. Although interested in stratigraphy he has developed an increasing interest in geomorphology and Pleistocene geology.

Professor Edmunds, because of his considerable experience in the occurrence of oil and gas deposits in the Province and their stratigraphic relationships, was appointed in 1952 to the Oil and Gas Conservation Board of Saskatchewan. This body acts as an adjudicating committee and has been very busy on account of the rapid development of the oil and gas industry in this Province. In 1945 the oil production was 16,508 barrels, in 1948, 842,902 barrels in 1956, 21,077,371 barrels and even with the cut back 44,625,903 barrels in 1958. Gas was piped to Saskatoon the fall of 1953 and to Regina in 1957. Many other communities are now on gas and others will follow. Gas heating has greatly improved living conditions on the Prairies and the oil and gas resources have had a marked affect on the Provincial economy.

, Professor Edmunds took his first sabbatical leave during the years 1955 and 1956. Besides Britain, he and Mrs. Edmunds visited South Africa, Australia and New Zealand, and just before the trouble broke in the Middle East he had a look at that most interesting and oil-rich part of the world. During his absence his classes were taken over by Dr. H. A. K. Charlesworth, a native of the North of Ireland, trained at Cambridge and Glasgow, who is now on the staff of the University of Alberta. This was the first Irish influence to which the Department has been subjected.

The course in Petroleum Engineering was initiated in 1955 under Dr. R. B. Shearn, a graduate of the University of Birmingham. Its value has been increasingly evident in the subsequent four years, and graduates are in demand. He returned to England in the spring of 1956. That fall he was replaced by Professor T. E. W. Nind, graduate of Cambridge where he was a Wrangler in mathematics. After taking training in petroleum engineering at the Royal School of Mines he joined the Royal Dutch Shell Company and was involved for seven years in reservoir engineering work in Venezuela, Borneo, and at The Hague.

Metals have been produced from the ores of the Flin Flon area since 1918 and in recent years the main ore body mined has been on the Saskatchewan side of the Saskatchewan-Manitoba border. In 1942 the Box Mine, a gold mine on the north shore of Lake Athabasca, ceased production on account of rising costs and its place was taken in 1953 by the start of uranium production in this district. Although there are others, the main producers have been the Beaverlodge operation of the Eldorado Mining and Refining Company of Canada and Gunnar Mines Limited. These and other finds have resulted in considerable prospecting and development work in various parts of the Province. The gross metal production in the Province amounted to \$6,203,389 in 1939-1940 and \$64,540,228 in 1956-1957.

As a result of all this activity in Northern Saskatchewan during the post-war period, Drs. Byers and Mawdsley spent most of their summers there on geological work. Byers, besides other mapping, spent seven years in the complex and mineralized Flin Flon area mapping in considerable detail 750 square miles, a piece of work that has received much commendation. Mawdsley worked in other sections of the northern part of the Province for a number of years, in areas where radioactive pegmatites were attracting attention. On these parties numerous students received apprentice training and from the data gathered have come a number of undergraduate and graduate theses.

The mineral production coupled with the oil and gas, coal and other non-metallics reached a figure of \$9,077,374 in 1939-1940, \$39,527,156 in 1950-1951, and \$122,722,429 in 1956-1957. These figures do not include the value of potash which first came into production fifteen miles east of Saskatoon in 1958, an industry which will be of considerable importance in the future. The revenue received by the Province from its mineral resources was \$104,618.97 in the fiscal year 1940-1941, \$1,881,881.14 in 1950-1951, and \$22,403,302.41 in 1956-1957.

During the years 1941, 1951, and 1957 the wheat production was valued respectively at \$88,772,000, \$244,996,000, and \$229,960,000. Obviously minerals and fuels have become a very important part of the Province's economy.

EXPANSION 1957 --

From the post-war low of 2,056 in the 1952-53 session, the number of students at the University increased by fifty per cent in the next four years to 3,070 in 1956-57, and to another fifty per cent in the next three years, to 4,483 in 1959-60. The increase in the numbers taking training to prepare themselves for work in the mineral industry not only reflects the University's growth but also the expansion of the mineral industry, especially in Western Canada.

This growth has been so unexpectedly rapid that, except for those directly involved in it, it is not generally appreciated. The Department has been materially helped during this stage by aid from three main outside sources. (a) From 1953 to 1959 the Tidewater Oil Company Operator has given \$8,500 which has been expended on library, and research and teaching equipment. The Departmental Library now ranks as one of the best in Western Canada. (b) Three yearly amounts of \$5,000 were received from the Shell Oil Company of Canada, Ltd., which made it possible in the fall of 1957 to add Dr. W. G. E. Caldwell to the staff, a palaeontologist trained at the University of Glasgow. Dr. Caldwell has spent the last two summers on palaeontological work for Shell in the Lower MacKenzie Valley. Through the kind permission of this company, an excellent collection of fossil invertebrates from the Arctic are being studied in the Department's laboratories. (c) At about the same time \$27,000⁽¹⁾ was received from a number of mining companies, National Research Council, and individuals to equip an Advanced Mineralogy and Petrology Laboratory with an X-ray diffractometer, high-pressure and high-temperature furnaces, and other research equipment. This made it possible for Dr. J. R. Smith, B.E.'49 (Sask) Distinction, Ph.D. 1954 (Princeton) to join the Department in the fall of 1957. For the three years prior to his arrival he held a Post-Doctorate Fellowship at the Carnegie Institution of Washington, Geophysical Laboratory. Besides being on the staff of the Geology Depart-

(1)

Eldorado Mining and Refining Company
Gunnar Mines Limited
Hudson Bay Mining and Smelting Co. Limited
International Nickel Company of Canada, Limited
Mid-West Metal Mining Association
Sheritt Gordon Mines Ltd.
National Research Council
Saskatchewan Research Council

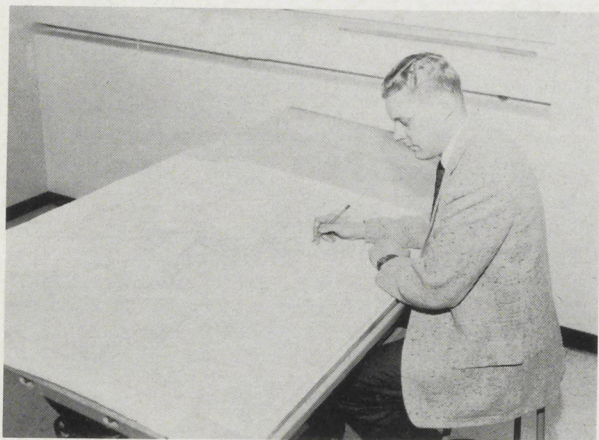
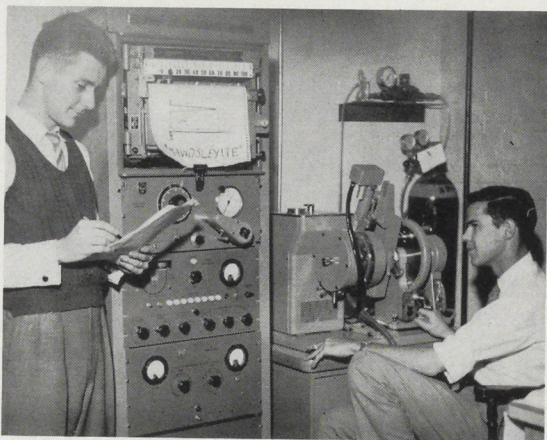
Franc R. Joubin
Gordon Bongard
Walter J. Blair

Gilbert A. LaBine
Strachan Bongard
Forrest W. Graham



Geology
Library
- late
at night

Dr. Arnold
and
Dr. Coleman
with
X-ray
equipment



Dr. Christiansen
working on
bedrock map

ment, one-third of his time is pledged to the Saskatchewan Research Council as Head of their Geology Division. In addition to his laboratory experience he has done considerable field work, including six summers in charge of field parties for the Quebec Bureau of Mines and as a member of two expeditions from Princeton University to Venezuela.

The addition of Drs. Caldwell and Smith to the staff has greatly broadened the Department's teaching and research potential. Another addition is Dr. D. H. Hall, a geophysicist, who arrived the fall of 1959 on a joint appointment by the University and the Saskatchewan Research Council. The great advances in the field of geophysics and the mounting need for men trained in it made it necessary to add an expert to the staff. Dr. Hall is an Honours Physics graduate from Alberta and a Ph.D. of the University of British Columbia. He has also received training in geophysics at Toronto and London and field experience in both oil and metallic mineral exploration.

A special grant from the National Committee on Research in the Geological Sciences for the session 1959-60 has made it possible to start Palynological studies (fossil pollen studies) under the guidance of Dr. Margaret Steeves a Ph.D. of Harvard.

In the spring of 1959 Trans-Prairie Pipelines Limited gave the Department \$2,500 for a teaching fellowship which it plans to use in obtaining a specialist in sedimentation.

Besides acknowledging the above very important, timely help the Department recognizes the valuable aid that various companies and the National and Saskatchewan Research Councils have given in the form of graduate and undergraduate scholarships. Both forms of assistance are appreciated, and are very necessary, if university training, which is expensive, is to be available to all able students and is to continue at a high standard. Not only are government subsidies and student fees necessary, but the stimulating recognition by industry of the worth of good training, by aiding it, is of fundamental importance. Possibly there is no investment which is more productive.

During the post-war years the Department acquired space wherever it could obtain it in the Engineering Building, such as room 108 on the second floor, and a couple of laboratories and a store room on the third floor. It is now back on the ground floor with no more space but a more convenient lay out. The old carpentry shop has been turned into two senior laboratories, the paint shop into the Department's chemical laboratory, and the old store room and John Low's supply room have become the laboratory for the introductory classes, used mornings and afternoons, and Advanced Mineralogy and Petrology Laboratory. Half the museum has been taken over by Petrology. The library and offices are new and more spacious. A couple of offices and the two Petroleum Engineering Laboratories occupy the space of the old Electrical Engineering Laboratory west of the hall on the ground floor. The Geophysical Laboratory and four offices are 150 yards northwest of the Engineering Building in part of the old Animal Husbandry Building. This wooden structure is one of the oldest buildings on the campus, the first horse stable. The three offices occupied by graduate students are referred to



Ernie Hawkins

Thin sections
cut to order



Mrs. Sins and
Joan Anderson

Department of
Double Spacing
and
One Inch Margins

as the chicken coops.

In spite of all the changes, the rapidly expanding number and the greater demands for advanced training mean that increases are already overdue in space, equipment, and staff. Although graduate work started in 1946 with two, who received their M.Sc. degrees two years later, now the Department is capable of offering much broader advanced training to a greater number, is better able to cope with the large classes of undergraduates and attract first class students to work in the mineral industry.

Besides the undergraduates courses now given: Geology in the Faculty of Arts and Science, and in the College of Engineering, Geological Engineering, Petroleum Engineering and Geological Engineering-Geophysical Option, it is hoped that eventually, among other things, the instruction in Mining may be strengthened for those who wish to join the graduates who are in mining work.

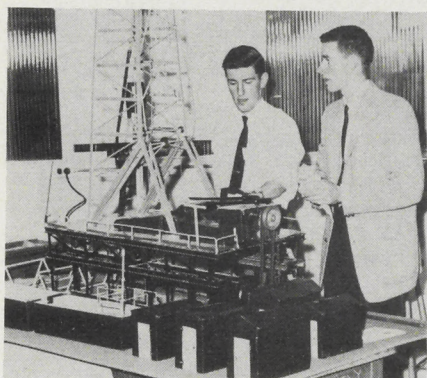
The field training received by the students with companies and on government surveys is a very important part of their education. The Department is particularly fortunate in its relationship with the Department of Mineral Resources, Regina and the Saskatchewan Research Council, whose laboratory is on the campus, for supplying much of this practical training, and research and theses problems. The close association of the staffs of the Geology Division of the Saskatchewan Research Council and the Department of Geology is most valuable and stimulating.

The graduates would be among the first to acknowledge the unstinting, cheerful service to the Department of Ernie Hawkins, technician and Jack-of-All-Trades since 1946. Also the secretaries who have manfully struggled with unfamiliar words and peculiar hand writings, and looked after the library, notably Charlotte Coates, (Mrs. R. E. Urton) and Mrs. L. Sins.

One department of a university alone can do no more than complete and round out a student's education. It must rely to a very great extent for its success on the teaching abilities of the members of other departments. The excellence and the willing cooperation of departments is a notable quality of this University. The understanding support received from the succeeding presidents and deans has likewise been characteristic and most valuable. This esprit de corps will be fully required in the rapid expansion that lies ahead. The estimate is that the undergraduate body on this campus will almost double and number over 7,500 by 1965. Every component of the University is bound to expand and it will have to receive considerable help to do this adequately and maintain the standards for which Saskatchewan is noted. Naturally the graduates and the present undergraduates of the Department, the Ore Gangue, have their part to play in this stirring and vital advance of their Alma Mater.



"After the game!"



"Spudding in"



"The Big Honker"



"Homecoming 1960"

ORE GANGUE

On January 18, 1934, the students in geology gathered together and decided to form a geological club and a committee was appointed to draw up a tentative constitution and to find a name for the society. The first regular meeting was held on January 23 at which the name Ore Gangue was adopted, the constitution approved and the following officers elected: President, S. E. Malouf; Vice-President, F. L. Croteau; Secretary - Treasurer, J. A. Thomson; and Executive, R. E. Garnett and R. B. Allen. We have only the barest record of what took place at that meeting, but we may assume that those present little expected that their newly formed club would play such an important part in student life as it has done during the past twenty-six years. Although active membership in the Ore Gangue was reduced to an unthought of figure of four during the Second World War, nevertheless the functions of the society as laid down by the founders have always been maintained by the students.

The manner of holding seminars, one of the principal functions of the Ore Gangue, was set forth in the original constitution as follows: "Each member, in his graduating year, will be expected to give a seminar upon a topic of interest in geology, mining, or metallurgy, the topic to be chosen by the member himself." The holding of these seminars has now become a tradition and the topics have covered a vast range of subjects from "Wild Life in the Mudjatik Area, Saskatchewan" to "Rotary Drilling". These seminars not only give experience in public speaking but also provide an opportunity to present the wide range of activities that are open to students of geology.

February 1937 witnessed the birth of the Concentrates, the official publication of the Ore Gangue. The first number, with L. S. Hill as Editor-in-Chief, was published that spring, and with the exception of the years 1952 and 1953 has appeared regularly each year. The desire of the founders was to provide "a method by which the graduates can keep in contact with the Ore Gangue, and with one another." Unfortunately because of the ever increasing number of graduates and the lack of funds the distribution of the Concentrates had to be curtailed in 1945 and since then the publication has been sent only to those graduates who are paid up subscribers.

On March 15, 1938, a special fund to be known as the Ore Gangue Fund was established with the understanding that it would be increased each year by the addition of any balance that might be left over from the year's operating fund. As set forth in the resolution the purposes of the fund were as follows: "The Ore Gangue Fund shall be used for the benefit of student and graduate members and the following recommendations are made to serve as an indication of the wishes of the founders of the fund: (a) Educational facilities (b) Establishment of student prizes or scholarships (c) Other purposes that may be considered justifiable by the trustees of the fund." The initial payment into the fund amounted to \$20.62.

When, in 1945, it was decided to erect a Memorial plaque in honour of those members of the Ore Gangue who fell during the Second World War, the Ore Gangue Fund formed the nucleus of the Memorial Plaque Fund. The plaque, designed by Professor A. L. C. Atkinson, was unveiled on November 11, 1948 and is over the door to the Geology Department in the Engineering Building.

The residue of the Plaque Fund was added to the Ore Gangue Memorial Fund which was initiated in 1945 by a bequest from the late Lt. Harold R. Robinson, Hon. B. A. '41. The fund was initially intended to supply a limited number of undergraduate bursaries, but in 1949 it was decided to institute two prizes to be given each year, if suitable candidates are available, the Ore Gangue Memorial Prize for leadership and the Ore Gangue Memorial Prize for the highest academic standing. The winner of the Leadership Prize is picked by the members of the Ore Gangue. On several occasions the winner of the Leadership Award has also had the highest academic standing. The recipients of these prizes are as follows:

	<u>Academic</u>		<u>Leadership</u>
1949	J. W. Keith		J. E. Stobart
1950	W. J. Pearson		
1951		L. W. Vigrass	
1952	P. Almond		P. R. Vogt
1953		P. R. Mathew	
1954	G. W. Crocker		E. A. Christiansen
1955		O. R. Eckstrand	
1956	G. D. Tikkanen		R. E. Olson
1957	M. B. Todd		R. A. Rudichuk
1958	D. R. Yont		D. A. Smith
1959	R. G. Gorrill		D. J. McCuaig
1960	T. W. Rey		M. A. Roed

During the winter of 1937 the Ore Gangue entered an exhibit at the Annual Chemistry Show. The displays included palaeontology, mineralogy, petrology, glacial geology, building stones, and mining. This aroused so much public interest that the Ore Gangue put on a much larger display in the Geology Department in conjunction with the Engineers' Open Nights, February 28th and March 1st, 1938, which attracted a capacity crowd of seventeen hundred people. It is of interest to note that it was mainly the profit from this show which formed the nucleus of the Ore Gangue Fund. Since 1938 the Engineering Show has been a biennial affair and the Ore Gangue displays are always a major attraction. It is one event at which Arts men and Engineers work in close cooperation and perfect harmony.

The first geological field trip of the Ore Gangue was made to the Eagle Hills and North Battleford on October 16th, 1937 to study possible oil and gas structures. In 1953 the Ore Gangue field trip took in the Little Rocky Mountains of Montana. This proved to be so interesting, both from a scenic and geologic stand-point, that it has become a biennial field excursion.

Social and sporting activities continue to play a prominent part in the life of the Ore Gangue. The annual autumn and spring banquets generally followed by a dance are the social highlight of the year. The effects of tight money in the late nineteen thirties and inflation since then are well illustrated in the cost per person for such functions: a dinner and dance in 1938-39 cost \$.75 to \$1.00 and this past year \$3.00 to \$3.25 per person. The Annual Reunion Day parade has occasionally contained a float prepared by members of the Ore Gangue. The winning of the Greig Cup for curling and the Donald Trophy for Tug-O-War in 1940-41 probably represents the brightest spot in the sporting history of the Ore Gangue. It was in that same year the Ore Gangue became a college according to the inscription on the Greig Trophy.

* * * * *

Ore Ganguesters young and old, remember the common elements in our lives! Few organizations are able to boast such a strong link between the past and the future as we may as geologists. More significantly we can credit our training largely to two men who formed the foundation upon which we have built our professional lives. Throughout the years a deep feeling of gratitude has grown towards Professors Mawdsley and Edmunds, and a form of expressing this gratitude has been and is desired by all. It is with this thought in mind that a scholarship has been proposed as a memorial to Professors Mawdsley and Edmunds.

The scholarship, presently in the initial stages of organization, will not only honour Professors Mawdsley and Edmunds but it will help finance a potential geologist in obtaining his education. The present objective is \$10,000 yielding an annual \$400.00 scholarship, however, these figures are not limits and the amounts may gain in future years.

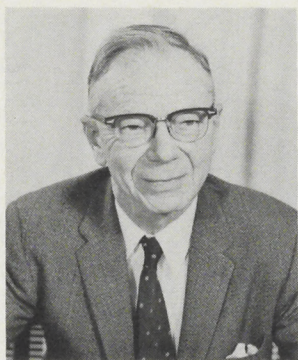
The present graduating class was asked how much they would be able to donate within the next few years. A vote was taken and the response was more than encouraging with an overwhelming majority deciding upon a contribution of \$30.00 each. This not only indicates enthusiasm but it also gives Ore Ganguesters, who have been in industry for some time, a yardstick to help measure their donation to the Scholarship Fund.

In total there are 350 people who have been members of the Ore Gangue at one time or another. Statistics indicate that a 50 per cent response is a very optimistic assumption but it is confidently felt that with a little reflection of years past the proposed scholarship will be loyally supported in the age-old tradition of the Ore Gangue.

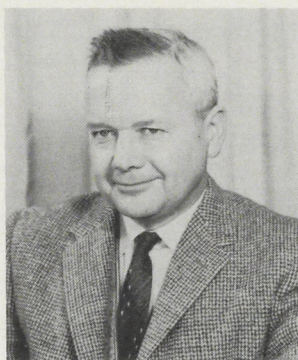
THE STAFF



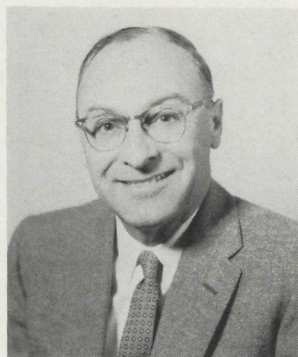
J. B. Mawdsley
1929 -



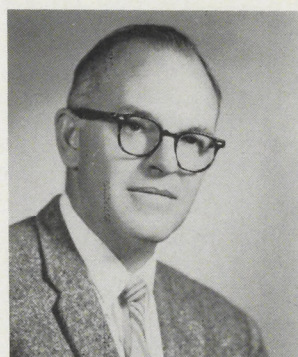
F. H. Edmunds
1927 -



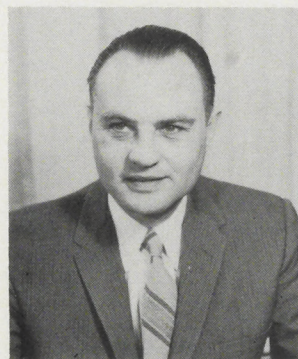
A. R. Byers
1940 -



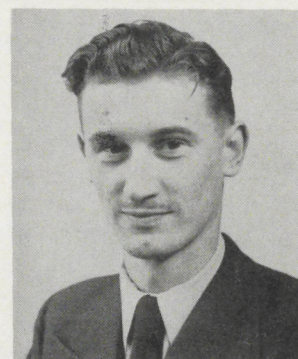
J. D. Weir
1946 - 1947



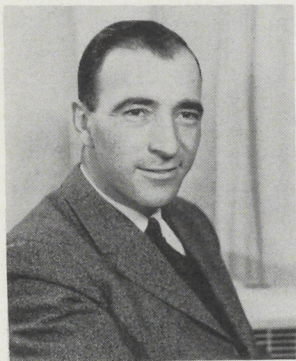
J. E. Riddell
1947 - 1949



W. O. Kupsch
1950 -



R. B. Shearn
1955 - 1958



J. R. Smith
1957 - 1960



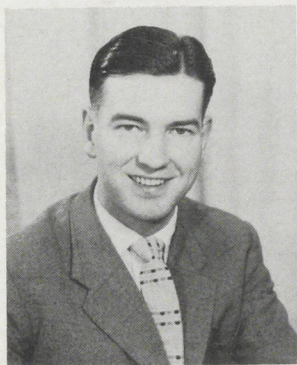
W. G. E. Caldwell
1957 -



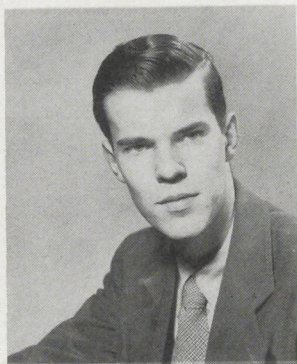
T. E. W. Nind
1958 -



D. H. Hall
1959 -



N. C. Wardlaw
1959 -



L. C. Coleman
1960 -

STAFF PUBLICATIONS

The publications by members of the Department are arranged in chronological groups to convey better the changes that have occurred both in the nature and quantity of the contributions, but also, to shed light on the growing general interest in the geology and the mineral resources of Saskatchewan. Papers completed by members of the Department prior to their joining the staff are not listed.

1929 - 1939

Edmunds, F. H.

- 1930 Soil mapping as an aid to geological interpretation: Canadian Inst. Mining Metallurgy Trans., v. 32, p. 10 - 24, 4 figs.; Canadian Inst. Mining Metallurgy Bull. 211, Nov. 1929.
- 1938a Some geological problems of central Saskatchewan: Canadian Inst. Mining Metallurgy Trans., v. 40 (1937), p. 45 - 58, 4 figs.
- 1938b Gas possibilities of the Kamsack district: Sask. Dept. Nat. Resources Ann. Rept. 1938, pt. II, p. 13 - 15.
- 1939a Placer gold along the North Saskatchewan River: Sask. Dept. Nat. Resources Ann. Rept. 1939, pt. II, p. 15 - 17, 1 pl.
- 1939b Riverhurst area: Sask. Dept. Nat. Resources Ann. Rept. 1939, pt. II, p. 19 - 22.
- 1939c Spruce Lake area: Sask. Dept. Nat. Resources Ann. Rept. 1939, pt. II, p. 22 - 25.

Edmunds, F.H. et al. (Jackson, J.L., Spinks, J.W.T. & Vigfusson, V.A.)

- 1938 Some skeletal remains in Saskatchewan: American Antiquity, v. 3, p. 244 - 246, 3 pls.

Mawdsley, J. B.

- 1930a Desmeloizes area, Abitibi district, Quebec: Geol. Survey Canada Summ. Rept. 1928, pt. C, p. 28 - 82.
- 1930b The Meach Lake conglomerate: Royal Soc. Canada Proc., v. 24, 3rd ser., sec. 4, p. 99 - 117, 1 fig., 1 table.
- 1931 Mineral possibilities in northern Saskatchewan with special reference to areas reconnoissanced in 1931: Sask. Dept. Nat. Resources, 26 p., mimeographed report.

- 1933 Desmeloizes sheet, Abitibi County, Quebec: Geol. Survey Canada, geol. map 284A, scale 1 inch to 1 mile.
- 1934a A brief outline of the geological history of northern Saskatchewan and some prospecting considerations: Sask. Dept. Nat. Resources Ann. Rept. 1933, app. 1, 7 p.
- 1934b A brief outline of the geological history of the northwest shore of Lac la Ronge and the Beaver Lake area: Sask. Dept. Nat. Resources Ann. Rept. 1933, app. 2, 20 p.
- 1936 The washboard moraines of the Opawica-Chibougamau area, Quebec: Royal Soc. Canada Trans., 3d. ser., v. 30, sec. 4, p. 9 - 12, 2 pls.
- 1938 Late gold and some of its implications: Econ. Geology, v. 33, p. 194 - 210, 1 fig.
- 1939 Memorial to Forrest Alexander Kerr (1896 - 1938): Geol. Soc. America Proc. 1938, p. 147 - 152, 1 pl.

Cooke, H.C., James, W.F. and Mawdsley, J.B.

- 1931 Geology and ore deposits of Rouyn-Harricana region, Quebec: Geol. Survey Canada Mem. 166, 314 p., 28 figs., 3 pls., geol. map.

Mawdsley, J.B., Gilchrist, L., Eve, A.S. and Keys, D.A.

- 1931 Studies of geophysical methods 1928 and 1929: Geol. Survey Canada, Mem. 165, 225 p., 66 figs., 11 pls. and plans.

Mawdsley, J.B. and Norman, G.W.H.

- 1935a Chibougamau sheet, Abitibi County, Quebec: Geol. Survey Canada, geol. map 304A, scale 1 inch to 1 mile.
- 1935b Chibougamau Lake map area, Quebec: Geol. Survey Canada, Mem. 185, 95 p., 7 pls. incl. geol. map.
- 1938 Chibougamau sheet, east half, Abitibi Territory, Quebec: Geol. Survey Canada, geol. map 397A, scale 1 inch to 4 miles.

James, W.F., Mawdsley, J.B. and Lang, A.H.

- 1935 Kinojevis sheet, Temiscamingue and Abitibi Counties, Quebec: Geol. Survey Canada, geol. map 306A, scale 1 inch to 1 mile.

1940 - 1945

Byers, A. R.

- 1940 Geology of the Night Hawk Peninsular Gold Mine: Econ. Geology, v. 35, p. 996 - 1011, 9 figs.
- 1941 Wall-rock alteration at Night Hawk Peninsular Mine, Night Hawk Lake, Ontario: Jour. Geology, v. 49, p. 279 - 291, 6 figs.

Edmunds, F. H.

- 1940a Lemberg-Melville area: Sask. Dept. Nat. Resources Ann. Rept. 1940, pt. II, p. 13 - 15.
- 1940b Some stages in the recession of the Pleistocene ice from Saskatchewan (abstract): Royal Soc. Canada Proc., 3d ser., v. 34, app. D, sec. 4, p. 161.
- 1940c Oil and gas developments in the Lloydminster area: Canadian Inst. Mining Metallurgy Trans., v. 43, p. 261 - 273, 4 figs., Canadian Inst. Mining Metallurgy Bull. 338, June 1940.
- 1943a Gas in the Kamsack area: Sask. Dept. Nat. Resources Ann. Rept. 1942, p. 67 - 68.
- 1943b Oil and gas possibilities in the Highland area, Saskatchewan: Sask. Dept. Nat. Resources Ann. Rept. 1942, p. 69 - 71.
- 1944a Oil and gas possibilities in Saskatchewan: Sask. Dept. Nat. Resources Ann. Rept. 1943, p. 49 - 56, (revised) Miner, June 1944, v. 17, no. 6, p. 43 - 49.
- 1944b Oil in shales: Sask. Dept. Nat. Resources Ann. Rept. 1943, p. 57 - 58.
- 1945a Drilling in Saskatchewan and the evidence of oil and gas: Canadian Inst. Mining Metallurgy Trans., v. 48, p. 221 - 236, 4 figs., Canadian Inst. Mining Metallurgy Bull. 396, April 1945.
- 1945b Salt in the Simpson No. 1 well: Sask. Dept. Nat. Resources Ann. Rept. 1944 - 1945, p. 47 - 49.
- 1945c The Kamsack gas: Sask. Dept. Nat. Resources Ann. Rept. 1945, p. 49 - 51.

Mawdsley, J. B.

- 1940 The Sulphide Lake gold-bearing belt, Lac la Ronge district, Saskatchewan: Canadian Inst. Mining Metallurgy Trans., v. 43, p. 287 - 298, 2 figs.; Canadian Inst. Mining Metallurgy Bull. 339, July 1940; (in part) Precambrian, 1940, March, p. 47 - 49 and April, p. 18.
- 1944 Prospecting possibilities in northern Saskatchewan: Precambrian, v. 17, no. 6, p. 4 - 7, 6 figs.

1946 - 1957

Byers, A. R.

- 1948 Porcupine Peninsular Mine: Canadian Inst. Mining Metallurgy Structural geology of Canadian ore deposits, v. 1, p. 565 - 569, 2 figs.
- 1949 Geology of the Waddy Lake area, Rottenstone mining division, Saskatchewan: Sask. Dept. Nat. Resources, Prec. Geology Ser., Rept. 1, 36 p., 10 figs., geol. map.
- 1953a Missi series, Amisk Lake area, Northern Saskatchewan: Royal Soc. Canada Trans., 3d ser., v. 47, sec. 4, p. 1 - 10, 5 figs.
- 1953b Granodiorite intrusion, Amisk Lake - Flin Flon region, northern Saskatchewan (abstract): Geol. Soc. America Bull., v. 64, p. 1542.
- 1954 Geology of Amisk and Wildnest Lake area: Precambrian, v. 27, no. 5, May 1954, p. 18 - 20.
- 1956a Geochemical investigations in the Flin Flon area: Canadian Mining Jour. v. 77, no. 4, p. 83 - 86, 4 figs., (abstract) Intern. Geol. Congress, 20th, Mexico 1956, Resúmenes de los trabajos presentados, p. 354.
- 1956b Sulphide deposits of northern Saskatchewan (abstract): Intern. Geol. Congress, 20th, Mexico 1956, Resúmenes de los trabajos presentados, p. 87.
- 1957a Comparison of electromagnetic geophysical prospecting methods over known sulphide zones in the Flin Flon area, Saskatchewan: Sask. Dept. Mineral Resources Rept. 28, 34 p., 9 figs., 1 plan; (abstract) Canadian Mining Jour., v. 78, no. 4, p. 130.

- 1957b Geology and mineral deposits of the Hanson Lake area, Saskatchewan: Sask. Dept. Mineral Resources Rept. 30, 47 p., 3 figs., 3 pls., geol. map.

Gill, J.E. and Byers, A.R.

- 1948 Surf Inlet and Pugsley mines: Canadian Inst. Mining Metallurgy, Structural geology of Canadian ore deposits v. 1, p. 99 - 104, 2 figs.
- 1948 Sladen Malartic Mine: Canadian Inst. Mining Metallurgy, Structural geology of Canadian ore deposits v. 1, p. 858 - 864, 3 figs.

Byers, A.R. and Dahlstrom, C.D.A.

- 1954a Geology and mineral deposits of the Amisk-Wildnest Lakes area, Saskatchewan: Sask. Dept. Mineral Resources Rept. 14, 169 p., 11 figs., 15 pls., 8 geol. maps. 1 structural map.
- 1954b Structure of the Amisk-Wildnest Lake area, Saskatchewan: Geol. Assoc. Canada Proc. v. 6, p. 27 - 36, 2 figs.; (abstract) Geol. Soc. America Bull., v. 64, p. 1404.

Thorvaldson, T. and Byers, A.R.

- 1956 Effect of chemical nature of aggregate on strength of steam-cured Portland cement mortars: Jour. American Concrete Inst. v. 52, p. 771 - 780.

Edmunds, F. H.

- 1946 Lloydminster oil field shows promise of substantial size: Precambrian, v. 20, no. 3, p. 4 - 7, 3 figs.
- 1947 Geology and its relationship to soils in Saskatchewan: In: MITCHELL, et al. (1944) and MITCHELL et al. (1950) 30 p., 4 figs., 4 pls.
- 1948 Lloydminster oil fields: Western Miner, v. 21, p. 127 - 130, 6 figs.
- 1953a Oil and gas developments in Saskatchewan: Western Miner and Oil Review, v. 26, no. 4, p. 72 - 75, 4 figs., 1 table.
- 1953b Will Saskatchewan discover its own Leduc? World Oil, v. 137, no. 7, p. 270 - 275, 1 fig., 1 table, correlation chart.
- 1954 Petroleum geology of western Canada: Petroleum Engineer, Oct. 1954, v. 26, no. 11, p. B39 - B52, 5 figs.
- 1957 Sodium sulphate in Saskatchewan: Canadian Inst. Mining Metallurgy, Geology Canadian Industrial Mineral Deposits (6th Commonwealth Mining Metallur. Cong.) p. 226-231, 2 figs., 3 tables.

Edmunds, F.H. and Ambler, J.S.

- 1951 Study of Lower Cretaceous sands in the Lloydminster area, Saskatchewan (abstract): Royal Soc. Canada Proc., v. 45, appendix D, p. 203.

Kupsch, W. O.

- 1952 Annotated bibliography of Saskatchewan Geology (1823 to 1951 incl.): Sask. Dept. Natural Resources Rept. 9, 106 p., 3 figs., map.
- 1953 Ordovician and Silurian Stratigraphy of east-central Saskatchewan: Sask. Dept. Natural Resources Rept. 10, 62 p., 16 figs., 5 pls., 1 table.
- 1954a Bituminous sands in till of the Peter Pond Lake area, Saskatchewan: Sask. Dept. Mineral Resources Rept. 12, 35 p., 8 figs., 1 pl., 1 table; (abstract; diff. title) Geol. Soc. America Bull., v. 64, 1953, p. 1548.
- 1954b Annotated bibliography of Saskatchewan geology 1952 and 1953: Sask. Dept. Mineral Resources, Supplement Rept. 9, 31 p.
- 1955a Drumlins with jointed boulders near Dollard, Saskatchewan: Geol. Soc. America Bull., v. 66, p. 327 - 338, 6 figs., 2 pls.
- 1955b Pioneer geologists in Saskatchewan: Sask. Dept. Mineral Resources, 50 p., 14 figs.
- 1956a Geology of eastern Cypress Hills (Knollys and Dollard Quadrangles). Saskatchewan: Sask. Dept. Mineral Resources Rept. 20, 30 p., 8 figs., 4 geol. maps.
- 1956b Cretaceous-Tertiary transition in southwestern Saskatchewan (abstract): International Geol. Cong., 20th, Mexico, 1956, Resúmenes de los trabajos presentados, p. 29.
- 1956c Geology of the Sturgeon Lake marl deposit, in: Sturgeon Lake marl deposit, Sask. Dept. Mineral Resources Rept. Inv. 8, 55 p., 14 figs., 3 pls., 10 tables.
- 1956d Crevasse fillings in southwestern Saskatchewan, Canada: Verhandelungen Koninklijk Nederlandsch Geologisch Mijnbouwkundig Genootschap, Geologische Serie, v. 16, p. 236 - 241, 2 figs.
- 1956e Submask geology in Saskatchewan: Bismark N. D., Conrad Publ. Co., First Williston Basin Symposium, p. 66 - 75, 8 figs.
- 1957a Frenchman formation of eastern Cypress Hills, Saskatchewan, Canada: Geol. Soc. America Bull., v. 68, p. 413 - 420, 1 pl., 3 tables; (abstract) Royal Soc. Canada Proc., v. 49, app. C., p. 40 - 41.

- 1957b Rocking Regina: Alberta Assoc. Petroleum Geologists Jour.,
v. 5, p. 222 - 223.

Scholten, Robert, Keenmon, K.A. and Kupsch, W.O.

- 1955 Geology of the Lima region, southwestern Montana and adjacent
Idaho: Geol. Soc. America Bull., v. 66, p. 345 - 404, 6 figs.
6 pls., 3 tables, geol map; (abstract) Geol. Soc. America
Bull., v. 62 (1951), p. 1454.

Meneley, W.A., Christiansen, E.A. and Kupsch, W.O.

- 1957 Preglacial Missouri River in Saskatchewan: Jour. Geology,
v. 65, p. 441 - 447, 3 figs., 1 table.

Mawdsley, J. B.

- 1946 Rottenstone Lake area, Saskatchewan: Geol. Survey Canada
Paper 46 - 24, 15 p., geol. map, 1 fig.
- 1948a Northern Saskatchewan, geological mapping and mining develop-
ment: Western Miner, v. 21, p. 40 - 43, 2 figs.
- 1948b Red Lake Gold Shore Mine, Ontario: Canadian Inst. Mining
Metallurgy, Structural Geology of Canadian ore deposits
v. 1 (1948), p. 334 - 340, 2 figs.
- 1949a Pine Channel area, Lake Athabasca district, Saskatchewan:
Geol. Survey Canada Paper 49 - 27, 46 p., geol. map.
- 1949b Metalliferous deposits in Dresser, J. A. and Denis, T. C.,
1949, Geology of Quebec, v. 3, Economic Geology: Quebec
Dept. Mines Geol. Rept. 20, p. 326 - 453, ill.
- 1951a Charlebois Lake area, Athabasca mining division, Northeastern
Saskatchewan: Sask. Dept. Nat. Resources, Memo. Ser. no. 2,
5 p., geol map.
- 1951b Find uranium oxide in pegmatite south of Charlebois Lake,
Saskatchewan: Precambrian, v. 24, p. 35.
- 1951c The geology of the Charlebois Lake area, Athabasca mining
division, northern Saskatchewan: Sask. Dept. Nat. Resources
Precambrian Geology Ser., Rept. 5, 30 p., 1 pl., 4 diagrams,
geol. map.
- 1951d Uraninitic pegmatites, northern Saskatchewan: Canadian
Mining Jour., v. 72, no. 1, p. 66 - 67, 2 figs.
- 1952 Uraninite-bearing deposits, Charlebois Lake area, Northeast-
ern Saskatchewan: Canadian Inst. Mining Metallurgy Bull.
482, June, v. 45, p. 366 - 375, 8 figs.

- 1953 Uraninite-bearing fine-grained pegmatite of the Charlebois Lake area, northeastern Saskatchewan (abstract): Geol. Soc. America Bull., v. 64, p. 1550.
- 1954 Radioactive, pronouncedly differentiated pegmatite sill, Lac la Ronge district, northern Saskatchewan: Econ. Geology, v. 49, p. 616 - 624, 2 figs.; (abstract) Econ. Geology, 1953, v. 48, p. 624; (abstract) Geol. Soc. America Bull., 1953, v. 64, p. 1452.
- 1955a Radioactive pegmatites of northern Saskatchewan: Canadian Mining Jour. v. 76, no. 5, p. 53 - 56, 1 map.
- 1955b Geology in the van: Royal Soc. Canada Trans., v. 49, 3rd ser., sec. 4, p. 1 - 5.
- 1956a Unfolding of the geology of northern Saskatchewan: Canadian Inst. Mining Metallurgy Bull. 527, March, v. 49, p. 199-203, 1 map.
- 1956b Geologists are in short supply: Geol. Assoc. Canada Proc., v. 8, pt. 1, p. 19 - 26, 4 tables.
- 1957a The geology of the Charlebois Lake area, northern Saskatchewan: Sask. Dept. Mineral Resources Rept. 24, geol. map.
- 1957b The geology of the Middle Foster Lake area, northern Saskatchewan: Sask. Dept. Mineral Resources Rept. 26, 45 p., 2 figs., geol. map.

Mawdsley, J.B. and Grout, F.F.

- 1951 The geology of the Stanley map area, Churchill mining division, northern Saskatchewan: Sask. Dept. Nat. Resources, Precambrian Geology Ser. Rept. 4, 31 p., 3 pls., geol. map.

Mawdsley, J.B. and Farquhar, R.M.

- 1955 Report of the committee on Precambrian and related dating: Royal Soc. Canada Trans., 3rd ser., v. 49, sec. 4, p. 37 - 45, 1 table.

1958 - 1960

Byers, A. R.

- 1959a Deformation of the Whitemud and Eastend formations near Claybank, Saskatchewan: Royal Soc. Canada Trans., 3d ser., v. 53, sec. 4, p. 1 - 11, 4 figs.

- 1959b Base Metal Mineralization associated with pegmatite, northern Saskatchewan: Geol. Assoc. Canada Proc., v. 11, p. 81-88, 3 figs.
- 1960 Sulphide Deposits in Saskatchewan: Canadian Inst. Mining Metallurgy Bull. March; Trans. V. LXIII, 1960, p. 86 - 93.

Caldwell, W. G. E.

- 1959 The Lower Carboniferous rocks on the Carrick-on-Shannon syncline: Quart. Jour. Geol. Soc. London, v. 115, p. 163-187, ill.

Caldwell, W.G.E. and Charlesworth, H.A.K.

- 1960 Visean coral reefs in the Bricklieve Mountains of Ireland: Proc. Geol. Assoc. London (submitted for publication).

Hall, D. H.

- 1959 Direction of polarization determined from magnetic anomalies: Jour. Geophys. Research, v. 64, p. 1945 - 1959.

Kupsch, W. O.

- 1958a Surface structure in southern Saskatchewan: Bismarck, N. D. Conrad Publ. Co., Second Williston Basin Symposium, p. 118 - 126, 11 figs., 1 topographic map.
- 1958b Review of Volume VII in the Arid Zone Research Series: Unesco Publications Committee (Canada) Rev. no. 7, March 1958, p. 34 - 36.
- 1959 Annotated bibliography of Saskatchewan geology (1823 - 1958 incl.): Sask. Dept. Mineral Resources Rept. 9 (Revised edition), 199 p., 2 figs., map.
- 1960a Radiocarbon dated organic sediments near Herbert, Saskatchewan: Am. Jour. Sci., v. 258, p. 282 - 292.
- 1960b Tee-thrust features in Western Canada (abstract): XXI International Geol. Congress, V. abstracts, p. 219 - 220.

Acton, D.F. et al. (Clayton, J.S., Christiansen, E.A. and Kupsch, W.O.)

- 1960 Physiographic divisions of Saskatchewan: Sask. Research Council, Map 1.

Kupsch, W.O. and Wild, J.

- 1958 Lineaments in Avonlea area, Saskatchewan: Am. Assoc. Petroleum Geologists Bull., v. 42, p. 127 - 134, 3 figs.

Gravenor, C. P. and Kupsch, W. O.

- 1959 Ice-disintegration features in western Canada: Jour. Geology
v. 67, p. 48 - 64, 4 figs., 6 pls.

Mawdsley, J. B.

- 1958 The radioactive pegmatites of Saskatchewan: International
(2nd) Conf. Peaceful Uses Atomic Energy Proc., v. 2,
p. 484 - 490, 1 fig.
- 1960 Iron deposits in northwestern Saskatchewan: Dept. Mineral
Resources Rept. 50, 19 p., 6 figs.

Nind, T. E. W.

- 1959 Profitability of oilfield projects: Oil/Gas World, v. 3,
no. 12, Dec. 1959, p. 14 - 21, 13 figs.
- 1960 A study of chamber lift: Canadian Inst. Mining Metallurgy
Trans., v. 63, p. 310 - 316, 5 figs., 3 app.

Smith, J. R. and Pyke, M. W.

- 1959 Microclines from a Precambrian granodiorite (abstract):
Royal Soc. Canada Proc., 3d ser., v. 53, sec. 4, app. C,
p. 22.

MASTERS' THESES

1949 - 1960

Almond, Peter

- 1953 Petrology of the Laminated Quartz Gneisses and the Quartz Diorites, Charlebois Lake Area, Northern Saskatchewan.

Ambler, John Stewart

- 1951 The Stratigraphy and Structure of the Lloydminster Oil and Gas Area.

Aston, Harold Frederick

- 1949 Spectrographic and Microscopic Investigation of some Saskatchewan and Manitoba Pyrrhotites.

Berg, Clifden Alexander

- 1953 The Stratigraphy of the Mississippian of the Kindersley Area, Saskatchewan.

Boyko, Waldimer Paul

- 1953 Mineralization and Wall Rock Alteration, Flin Flon Area, Saskatchewan.

Chernoff, Charlie Nicholas

- 1960 Lithology of the Interlake Group in Saskatchewan.

Christiansen, Earl Alfred

- 1956 Glacial geology of the Moose Mountain Area, Saskatchewan.

Clark, Lloyd Allen

- 1956 Sulphide Deposits of the Hanson Lake Area.

Cumming, George Leslie

- 1952 A Petrographic and Radiometric Study of the Tazin Meta-Sediments of the Charlebois Lake Area, Northeastern Saskatchewan.

Dahlstrom, Clinton Dennis A.

- 1949 Petrological Studies in the Tazin Group of Lake Athabasca.

Eckstrand, Olof Roger

- 1957 Igneous and Metamorphic Hornblendes from the Amisk-Wildnest
Lakes Area, Saskatchewan.

Edwards, Robert Garry

- 1959 Cretaceous Spinney Hill Sand in West Central Saskatchewan.

Faulkner, Edward Leslie

- 1960 The Colourimetric Determination of Trace Elements in
Pyrrhotite.

Froese, Edgar

- 1957 Metamorphosed sediments of the Middle Foster Lake Area,
Northern Saskatchewan.

Goldak, George Robert

- 1960 A New Method for the Measurements of X-ray Diffraction
Angles and Unit Cell Dimensions.

Hovdebo, Harold Robert

- 1958 Structure of the Brule-Crossing Creek Area, British
Columbia.

Kent, Donald Martin J.

- 1959 The Lloydminster Oil and Gas Field, Alberta.

Kermeeen, James Seton

- 1955 A Study of some Uranium Mineralization in Athabasca
Sandstone, near Stony Rapids, Northern Saskatchewan.

Kirkland, Samuel John T.

- 1952 Petrology of the Granites and Pegmatites, Charlebois
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McCamis, John Graham

- 1958 Anhydritization in the Mississippian Souris Valley Beds
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- 1955 The Viking Formation in Saskatchewan.

Meneley, Robert Allison

1958 Nisku format in Saskatchewan.

Meneley, William Allison

1960 Theory of Microfabric Analysis.

Mullock, John Edward

1952 Biogeochemical and Geochemical Research in the Amisk Lake and Flin Flon Region.

Pearson, Walter John

1951 The Origin and History of the Neagle Lake Pluton in the Amisk Lake Area.

Petruk, William

1956 Petrofabric Analysis of the Amisk and Missi Sediments in the Amisk and Hanson Lake Area.

Powley, David Edward

1951 Devonian Stratigraphy of Central Saskatchewan.

Pyke, Murray William

1959 Microclines from a Precambrian Granodiorite.

Rotherham, Donald Charles

1955 A Study of some Radioactive Granites and Pegmatites in Northern Saskatchewan.

Sawatsky, Lawrence Harvey

1959 The Lloydminster Field, Saskatchewan.

Shackleton, James Stephen

1957 A Petrographic Study of the Granitic Intrusives of the Middle Foster Lake Area, Northern Saskatchewan.

Shklanka, Roman

1958 The Petrogenesis of the Porter Lake Dome, Porter Blackstone Lakes Area, Northern Saskatchewan.

Vigrass, Laurence William

1952 Jurassic Stratigraphy of Southern Saskatchewan.

Waddell, William Henry

1957 Study of the Peace River Formation, Northwestern Alberta.

Wild, Jack

1960 Types of Structures in Southern Saskatchewan.

Williams, Frederick James

1952 Devonian Stratigraphy of Southern Saskatchewan.

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1960 Devonian Reefs in West Central Saskatchewan.

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International Petroleum,
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1939

1945

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